DOCUMENT RESUME

ED 079 153 SE 016 541

AUTHOR	Warpinski, Robert
TITLE	A Supplementary Program for Environmental Education, Industrial Arts, Grade 7-12.
INSTITUTION	Project I-C-E, Green Bay, Wis.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	72
NOTE	76p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Behavioral Objectives; *Environmental Education; Fundamental Concepts; *Industrial Arts; Instructional Materials; Interdisciplinary Approach; Learning Activities; *Lesson Plans; *Secondary Grades; *Teaching Guides
IDENTIFIERS	ESEA Title III

ABSTRACT

Presented in this teacher's guide for grades 7-12 are lesson plans and ideas for integrating industrial arts (drafting, woodworking, and metals) and environmental education. Each lesson originates with a fundamental concept pertaining to the environment and states, in addition, its discipline area, subject area, and problem orientation. Following this, behavioral objectives and suggested learning experiences are outlined. Behavioral objectives include cognitive and affective objectives and skills to be learned, while learning experiences list student-centered in-class activities and outside resource and community activities. Space is provided for teachers to note resource and reference materials--publications, audio-visual aids, and community resources. The guides are supplementary in nature and the lessons or episodes are designed to be placed in existing course content at appropriate times. This work was prepared under an ESEA Title III contract for Project I-C-E (Instruction-Curriculum-Environment). (BL)

ED 079153

Project I - C - E INSTRUCTION - CURRICULUM - ENVIRONM

U.S. DEPARTM
EDUCATION
NATIONAL I
EDUC
THIS DOCUMENT
DUCED EXACTLY
THE PERSON OR OR
ATING IT. POINTS O
STATED DO NOT NE
SENT OFFICIAL NAT
EDUCATION POSITI

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Industrial Arts GRADE 7-12

1. Drafting
2. Woodworking
3. Metals

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
1927 Main Street
Green Bay, Wisconsin 54301
(414) 432-4338
(after Dec. 1, 1972 - 468-7464)

Robert Warpin
Robert Kellne
George Howlet

SE016 541

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to: SE IR

In our judgement, this document is also of interest to the clearinghouses noted to the right. Indexing should reflect their special points of view.

INSTRUCTION - CURRICULUM - ENVIRONMENT

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

I FOR ENVIRONMENTAL EDUCATION

rial Arts GRADE 7-12

nfting

odworking

tals

II E.S.E.A.

A's 3-8-9

54301

468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Director
George Howlett, EE Specialist

PREFACE

"Oikus" for house is the Greek origin of the term "ecology". studies our house--whatever or wherever it may be. Like an umbr expand or contract to fit many ranges--natural and man-made. We envirorments, our many "houses" if we omit rancor and cite long complexities. Cur "oikus" uses the insights of all subjects. T multidisciplinary program like ours necessarily results. Also, a long time, our program ranges K thru 12. The environment mirr values. These values have their origin in the "oikus" of our co minds. Let us become masters of our house by replacing the Gree with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is s to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your studen to adapt or adopt. Limitless chances are here for your exper Many episodes are self contained, some open-minded, still oth developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no gu and no curriculum will work unless viewed in the context of y
4. React to this guide with scratch ideas and notes on the episo
5. After using an episode, fill out the attached evaluation form duplicate, or request more of these forms. Send them singly We sincerely want your reactions or suggestions--negative and evaluations are the key in telling us "what works" and in aid the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all p school districts in CESA 3, 8, and 9. Check the Project ICE Bib resources. Cur address and phone number is on this guide's cove or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Av Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or process

Affective refers to student attitudes, values, and feelings.

PREFACE

the Greek origin of the term "ecology". Environmental education
tever or wherever it may be. Like an umbrella, our house can
fit many ranges--natural and man-made. We can add quality to our
"houses" if we omit rancor and cite long range gains, costs, and
kus" uses the insights of all subjects. Thus, a rational, positive,
ram like ours necessarily results. Also, since attitudes grow over
am ranges K thru 12. The environment mirrors our attitudes or
have their origin in the "oikus" of our collective and individual
masters of our house by replacing the Greek adage of "Know thyself"
thine house."

d by your fellow teachers, this guide is supplementary in nature--
y into existing, logical course content.
e offers suggestions. Knowing your students best, you decide what
Limitless chances are here for your experimentation and usage.
elf contained, some open-minded, still others can be changed or
w days.
but please pre-plan. Why? Simply, no guide has all the answers,
ill work unless viewed in the context of your students.
with scratch ideas and notes on the episode pages.
ode, fill out the attached evaluation form in the back. Use,
st more of these forms. Send them singly or collectively to us.
our reactions or suggestions--negative and positive. Your
key in telling us "what works" and in aiding our revisions of

MS

CE Resource Materials Center serving all public and non-public
CA 3, 8, and 9. Check the Project ICE Bibliography of available
s and phone number is on this guide's cover. Feel free to write
rials or help.
dio Visual Instruction, 1327 University Avenue, P. O. Box 2093,
1 (Phone: 608-262-1644).
surable mental skill, ability, or process based on factual data.
tudent attitudes, values, and feelings.

ACKNOWLEDGEMENTS: The following teachers and consultants participated in the
of the Supplementary Environmental Education Guides:

CESA #3

D. C. Aderhold, Bonduel
John Anderson, Peshtigo
Walter Anderson, Wausaukee
Bonnie Beamer, Coleman
Merlyn Blonde, Shawano
R. A. Dirks, Gillett
Dennis Dobrzenski, White Lake
LeRoy Gerl, Oconto
Karen Grunwald, St. James (L)
William Harper, Lena
Sister Claudette, St. Charles
Ervin Kunesh, Marinette
Kathleen LeBreck, Oconto
P. E. Lewicki, Gillett
Dorothy O'Brien, Wausaukee
Terry Otto, St. John (L)
Arthur Paulson, Oconto Falls
Marie Prochaska, Lena
Christine Proctor, Wausaukee
Arthur Schelk, Suring
Peter Skroch, Oconto Falls
David Soltesz, Crivitz
Bill Stillion, Shawano
Cathy Warnack, White Lake

Consultants

CESA #3

Dr. Richard Presnell,
Univ. of Wisc.-Green Bay

CESA #8

Dr. James Marks,
Lawrence University

CESA #9

Dr. Charles Peterson,
St. Norbert College

CESA #8

Mary Anders, Winneconne
Robert Becker, Fox Valley (L)
Mary Chriss, Hortonville
Cliff Christensen, Winneconne
Kenneth Couillard, Hortonville
Raymond Emerich, Hortonville
Mike Ercegovac, Winneconne
Dona Geeding, Menasha
Donald Hale, Winneconne
James Huss, Freedom
Sister Lois Jonet, Holy Angels
Kenneth Kappell, St. Aloysius
Kenneth Keliher, Appleton
Everett Klinzing, New London
Fred Krueger, Oshkosh
Jim Krueger, Winneconne
Mae Rose LaPointe, St. John High
Rosemarie Lauer, Hortonville
Robert Lee, Neenah
Harold Lindhorst, St. Martin (L)
Dennis Lord, Little Wolf
Robert Meyer, Neenah
Arnold Neuzil, Shiocton
James Nuthals, Lourdes
Connie Peterson, St. Martin (L)
Rosemary Rafath, Clintonville
Mark Reddel, St. Martin (L)
Gladys Roland, Little Wolf
Kathryn Rowe, Appleton
Mary Margaret Sauer, Menasha
Edwin Schaefer, Kaukauna
Lee Smoll, Little Chute
Doris Stehr, Mt. Calvary (L)
Ginger Stuvetraa, Oshkosh
Richard Switzer, Little Chute
Tim Van Susteren, Holy Name
Lila Wertsch, St. Margaret Mary
Warren Wolf, Kimberly
Gery Farrell, Menasha

C
Peter Biolo
Lee Clasen,
Kathryn Col
Merle Colbu
Sara Curtis
Duane DeLor
Roberta Dix
Janet Eling
Phyllis Ell
Keith Fawce
Jack Giachi
Mike Gleffe
Herbert Har
Gary Heil,
Nannette Ho
Joseph Huce
Catherine H
DeAnna John
Kris Karpin
Mel Kasen,
Jack Koivis
Sister Mary
Ellen Lotz,
Judilyn McG
Priscilla M
C. L. Paque
William Rob
Roger Rozno
Jan Serrahn
Calvin Sieg
Mary Smith,
Carol Trimb
Mary Wadzin

chers and consultants participated in the development
ary Environmental Education Guides:

CESA #8	CESA #9
nders, Winneconne	Peter Biolc, West DePere
t Becker, Fox Valley (L)	Lee Clasen, Lux.-Casco
hriss, Hortonville	Kathryn Colburn, Algoma
Christensen, Winneconne	Merle Colburn, Algoma
h Couillard, Hortonville	Sara Curtis, Green Bay
d Emerich, Hortonville	Duane DeLorme, Green Bay
rcegovac, Winneconne	Roberta Dix, St. Joseph Acad.
eeding, Menasha	Janet Elinger, Ashwaubenon
l Hale, Winneconne	Phyllis Ellefson, Wash. Isle.
Huss, Freedom	Keith Fawcett, West DePere
Lois Jonet, Holy Angels	Jack Giachino, Seymour
h Kappell, St. Aloysius	Mike Gleffe, St. Matthews
h Keliher, Appleton	Herbert Hardt, Gibraltar
t Klinzing, New London	Gary Heil, Denmark
rueger, Oshkosh	Nannette Hoppe, How.-Suam.
ueger, Winneconne	Joseph Hucek, Pulaski
se LaPointe, St. John High	Catherine Huppert, DePere
rie Lauer, Hortonville	DeAnna Johnson, Denmark
Lee, Neenah	Kris Karpinen, West DePere
Lindhorst, St. Martin (L)	Mel Kasen, Gibraltar
Lord, Little Wolf	Jack Koivisto, Green Bay
Meyer, Neenah	Sister Mary Alyce, Cathedral
Neuzil, Shiocton	Ellen Lotz, West DePere
Nuthals, Lourdes	Judilyn McGowan, Green Bay
Peterson, St. Martin (L)	Priscilla Mereness, Wrightstown
ry Rafath, Clintonville	C. L. Paquet, Denmark
eddel, St. Martin (L)	William Roberts, Sturgeon Bay
Roland, Little Wolf	Roger Roznowski, Southern Door
n Rowe, Appleton	Jan Serrahn, Sevastopol
argaret Sauer, Menasha	Calvin Siegrist, How.-Suam.
Schaefer, Kaukauna	Mary Smith, Green Bay
oll, Little Chute	Carol Trimberger, Kewaunee
Stehr, Mt. Calvary (L)	Mary Wadzinski, How.-Suam.
Stuvetraa, Oshkosh	
d Switzer, Little Chute	
n Susteren, Holy Name	
ertsch, St. Margaret Mary	
Wolf, Kimberly	
arrell, Menasha	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

I. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area Industr

Subject Draftin

Problem Orientation How is related to the Diazo

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING F	II.
Cognitive: The student will be able to produce a quality Diazo Print--properly exposed. Affective: The student will understand the importance of original's overall quality and exposure time to print development. Skills to be Learned 1. Line weight quality. 2. Operation of Diazo Machine. 3. Overall neatness 4. Selection of Diazo reproduction materials (if more than one are used)	I. Student-Centered in class activity A. Demonstrate need for translucent original--Run print using opaque and translucent original. Compare results. B. Show film. C. Make print with Sun Frame method. D. Make print with Diazo process. E. Have students compare and discuss process and results. Advantages and disadvantages F. Point out Diazo Process is controlled Sun energy. G. Develop bulletin board for trouble shooting Diazo prints (If this happened-you did this wrong) H. List other "Sun Energy" uses	

the basic source
erted through
into a form
use for life

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation How Sun Energy is related to the Diazo Process

Grade 7-12

ance

ed)

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity	II. Outside Resource and Community Activities
A. Demonstrate need for translucent original-- Run print using opaque and translucent original. Compare results. B. Show film. C. Make print with Sun Frame method. D. Make print with Diazo process. E. Have students compare and discuss process and results. Advantages and disadvantages F. Point out Diazo Process is controlled Sun energy. G. Develop bulletin board for trouble shooting Diazo prints (If this happened-you did this wrong) H. List other "Sun Energy" uses	A. Visit commerical blue print operation.

Resource and Reference Materials	Continued and Additional Suggest
Publications: Industrial Arts Drafting, Walker-Nevyak, Goodheart-Willcox Co. Drafting Technical Comm., Lawrence S. Wright, McKnight & McKnight Audio-Visual: Walt Disney's "The Mystery of The Cosmic Rays." Community:	

terials	Continued and Additional Suggested Learning Experiences
ng, rt-	
n.,	
y	

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT: C2 All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline-Area Indus

Subject Draft

Problem Orientation C

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will clean-up when the period arrives, and not only do his responsibility but also check overall results. Affective: The student will understand all living systems interact among themselves and their environment, realizing clean-up is a combined effort, not an effort by an individual.	I. Student-Centered in class activity. A. Let clean-up go for one day. B. Allow students to work 2nd day in messy area with dirty equipment. C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilies stressing teamwork. E. Discuss and compare results of clean-up versus no clean-up, and discuss group interaction as it relates to clean-up.
Skill to be Learned A. Cooperation B. Responsibility C. Benefits of clean-up. 1. Neater drawings. 2. Equipment in proper place. 3. Better working atmosphere. 4. Safer place to work.	

nteract

heir

intricate

em.

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Clean-Up Grade 7-12

S	SUGGESTED LEARNING EXPERIENCES	
	I. Student-Centered in class activity. A. Let clean-up go for one day. B. Allow students to work 2nd day in messy area with dirty equipment. C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilies stressing teamwork. E. Discuss and compare results of clean-up versus no clean-up, and discuss group interaction as it relates to clean-up.	II. Outside Resource and Community Activities A. Field trip to local manufacturing area to view practical applications and advantages of neatness and cleanliness. B. Presentation by industrial commission representative on safety and production as related to neatness and teamwork.

Resource and Reference Materials	Continued and Additional Suggested Learni
Publications:	(Con't from E) 1. Develop methods of making clean-up re more efficient. 2. Develop list on where else a team cle would be beneficial.
Audio-Visual:	
Community: Safety Inspector Industrial Commission	

nued and Additional Suggested Learning Experiences

't from E)

Develop methods of making clean-up responsibility more efficient.

Develop list on where else a team clean-up effort would be beneficial.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT		
C O N C E P T	3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.	Discipline Area Subject Problem Orienta

BEHAVIORAL OBJECTIVES	SUGGESTED L
Cognitive: Students will be able to select and or design joint (s) that best suits the job, (Appearance, strength, ease of making, etc.) Affective: The student will understand how grain, materials, fasteners, fit affect joint quality. Skills to be Learned Joint use and design 1. Material strength 2. Joint use A. Inside-Outside B. Structural Apearance 3. Ease of construction.	I. Student-Centered in clas activity A. Have students design simple joints for strength and or appea ance. B. Develop test for join around available equi ment, test for: 1. Strength A. Shear B. Stress C. Compression D. Tensile 2. Appearance (Pure value judge 3. Ease of making & cation C. Incorporate joints in project drawing. D. Bean bag discussion "Draw parallels betwee joint breakdown and ecosystem breakdown. (i.e. Poorly constructe neglected joint breaks under stress, as ecosy does when congested, a or neglected.

l factors are limiting

f organisms living

luence, thus, each

carrying capacity.

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Joint Design & Carrying Capacity

Grade 7-12

CTIVES	SUGGESTED LEARNING EXPERIENCES	
ct (s) job, n, nt will mater- affect	I. Student-Centered in class activity A. Have students design simple joints for strength and or appearance. B. Develop test for joints around available equipment, test for: 1. Strength A. Shear B. Stress C. Compression D. Tensile 2. Appearance (Pure value judgement) 3. Ease of making & application C. Incorporate joints in project drawing. D. Bean bag discussion "Draw parallels between joint breakdown and ecosystem breakdown. (i.e. Poorly constructed or neglected joint breaks down under stress, as ecosystem does when congested, abused or neglected.	II. Outside Resource and Community Activities A. Field trip to local manufacturing plant. Talk with product engineer. B. Forest products lab. evaluate students joint designs.
h ide pearance tion.		

Resource and Reference Materials	Continued and Additional Suggested
Publications: Drafting Technical Communication Lawrence S. Wright McKnight & McKnight, Bloomington, Ill., 1968 Mechanical Drawing French & Svensen McGraw Hill, 1966 Audio-Visual: Stanley Tools Film Strips Charts Movies Bavi #2666 Design for ARC Welded Structures Bavi #1217 Using Nails and Screws Community: Forest Products Laboratory	Continued evaluation of joint se Develop a collection of joints. Conduct a contest for joint stre quality wanted.

ence Materials	Continued and Additional Suggested Learning Experiences
Communication t, 1968 for ARC Welded ails and Screws boratory	Continued evaluation of joint selection. Develop a collection of joints. Conduct a contest for joint strength or whatever quality wanted.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT: 4. An adequate supply of pure water is essential for life.

Discipline Area: Industr

Subject: Draftin

Problem Orientation: Wast

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will be able to list the types of paper used in drafting. The student will be able to name the paper companies having waste water treatment. Facilities within a 20 mile radius of the school. Affective: The student will appreciate the effect of clean water on recreation, fishing, ect.	I. Student-Centered in class activity A. Students will study types of paper used in drafting. 1. Rag 2. Sulphite B. In connection with paper making, student will study water treatment facilities in paper companies. 1. Machine used in treatment. 2. Chemicals used in treatment. 3. Short and long term plans for water treatment facilities. C. Develop bulletin board flow charts showing waste water treatment process.
Skills to be Learned 1. Paper composition 2. How paper is made 3. The treatment of water after it is used in a paper mill.	

pply of pure

l for life.

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Waste Water Grade 7-12

IVES	SUGGESTED LEARNING EXPERIENCES	
t will pes of . The o es at- in a school. t will of ion,	I. Student-Centered in class activity A. Students will study types of paper used in drafting. 1. Rag 2. Sulphite B. In connection with paper making, student will study water treatment facilities in paper companies. 1. Machine used in treatment. 2. Chemicals used in treatment. 3. Short and long term plans for water treatment facilities. C. Develop bulletin board flow charts showing waste water treatment process.	II. Outside Resource and Community Activities A. Field trip to a paper mill. B. Public relations dept. of a local paper mill.
ter a		

Resource and Reference Materials	Continued and Additional Suggested Lear
Publications: Books: Pulp and Paper, 500 Howard St. San Francisco, Calif. 94105 American Paper Industry 2570 Devon Avenue DesPlaines, Ill. 60018 Chem Paper Processing Hale Publishing Company One Park Street Stanford, Conn. 06901 Audio-Visual: Recyling Paper Riverside Paper Company Appleton, Wisconsin Great White Trackaway Hammermill Paper Company Erie, Pennsylvania Community: Public Relations Dept. of an area paper mill.	

s	Continued and Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project ICE

CONCEPT

5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area

Subject

Problem Orientat

BEHAVIORAL OBJECTIVES	SUGGESTED LE
Cognitive: The student will be able to plan and design a sub-division including adequate vegetation areas. Affective: The student will list two or three ways in which vegetation areas promote air quality Skill to be Learned A. Plot planning B. Space conservation C. Organic architecture	I. Student-Centered in class activity A. Teacher will explain an lead discussion on phot synthesis. B. Determine (as a result discussion) why trees, shrubs, and other green are important to clean C. Have students roughly design sub-division by using plot plans. D. Evaluate sub-divisions 1. Green Areas 2. % of house to lot 3. Privacy area 4. Practicality

e supply of clean air

ecause most organisms Discipline Area Industrial Arts

n, through respiration, Subject Drafting - Arch.

nergy in their food. Problem Orientation Green Areas Grade 11-12

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
dent will d design luding n areas. dent will ways in reas pro-	I. Student-Centered in class activity A. Teacher will explain and lead discussion on photo-synthesis. B. Determine (as a result of discussion) why trees, shrubs, and other greenery are important to clean air. C. Have students roughly design sub-division by using plot plans. D. Evaluate sub-divisions on: 1. Green Areas 2. % of house to lot 3. Privacy area 4. Practicality	II. Outside Resource and Community Activities A. Presentation by sub-division planner who utilizes vegetation areas. B. Field trip or area study of local sub-divisions to see if studied concepts are actually applied.
d ion cture		

Resource and Reference Materials	Continued and Additional Suggested
Publications: Architecture Drafting and Design, Hepler & Wallach McGraw Hill, 1965 Soil Surveys and Land Use Planning, Soil Science Society of America & American Society of Agronomy, 1966 Audio-Visual: Bavi #6730 New Guidelines for the Well Landscaped Home. Community: 1. Sub-Division Planner	1. Have students continue sear "Ideal" sub-division in are usage for air quality.

s	Continued and Additional Suggested Learning Experiences
	1. Have students continue searching for "Ideal" sub-division in areas of vegetation usage for air quality.

ESEA Title III -59-7000135-2 Project I-C-E

CONCEPT

6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area Industrial

Subject Drafting

Problem Orientation Proje

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	II.
Cognitive: Each student will be able to efficiently plan projects to use as little natural resources as possible. Affective: The student will be given guide lines for a specific project and he will choose materials which reflect low waste. Skills to be Learned A. Maximum material useage B. Production planning C. Production efficiency	I. Student-Centered in class activity A Design projects that will be of a nature that will help students plan projects to put natural resources to their greatest use-- As little waste as possible Example: Design bird houses from a 4 x 8 plywood sheet. A. Bird house requirement 1. Floor size 2. Hole size 3. Hole above floor 4. Bird Design house cutting diagram.	

ources are not equally

r the earth or over

y affect the geo-

ons and quality of

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Project Planning Grade 7-12

CTIVES	SUGGESTED LEARNING EXPERIENCES	
ent will ly plan ttle possible. nt will for a ne will n reflect	I. Student-Centered in class activity A Design projects that will be of a nature that will help students plan projects to put natural resources to their greatest use-- As little waste as possible Example: Design bird houses from a 4 x 8 plywood sheet. A. Bird house requirement 1. Floor size 2. Hole size 3. Hole above floor 4. Bird Design house cutting diagram.	II. Outside Resource and Community Activities A.DNR . Representative B. Forest Products Lab.
useage ing iency		

Resource and Reference Materials	Continued and Additional Suggested Learnin
Publications: DNR. Publications Drawing for Product Planning, George E. Stephenson Chas. A. Bennette Co.,Inc. 1970 Audio-Visual: Community: Design engineers from local manufacturer.	1. On every project reflect material use 2. Develop a collection of projects whic excellent material usage.

ials	Continued and Additional Suggested Learning Experiences
2, 1970	1. On every project reflect material useage. 2. Develop a collection of projects which reflect excellent material usage.

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT

7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population desity.

Discipline Area In

Subject Dr

Problem Orientation

BEHAVICRAL OBJECTIVES	SUGGESTED LEARN
Cognitive: The student will know how lack of planning years ago is now producing land use problems in his local community. Affective: The student will list the steps to be taken for better community land use. Skills to be Learned How to help in community planning for maximum land usage. Basic map making & reading of topographical maps. Use of cameras & tape recorders.	I. Student-Centered in class activity A. Students working in group will produce a slide presentation of good and poo land use in the community B. Discussion on steps to be taken for better local land use.

rs such as facilitating

ation, economic conditions,

n growth, and increased

ime have a great influence
s in land use and centers
tion desity.

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Community Planning Grade 11-12

AL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
he student lack of plann- is now pro- se problems in unity. he student steps to better d use.	I. Student-Centered in class activity A. Students working in groups will produce a slide presentation of good and poor land use in the community. B. Discussion on steps to be taken for better local land use.	II. Outside Resource and Community Activities A. Community Planners make a presentation of future plans for the community. B. Field trip around the community with students taking pictures and recording comments on tape for future presentations.
earned n community aximum land ing & reading cal maps. & tape		

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: HUD Literature Architecture Drafting and Design,,Hepler & Wallach McGraw Hill, 1965 Soil Surveys and Land Use Planning, Soil Science Society of America & American Society of Agronomy, 1966 Audio-Visual: Student and teachers developed slides. Community: City Plan Commission	Develop picture collection of good and land use. Conduct a Contest 1. Select a real piece of property the the community which presents problem ie, gravel pit, swamp. develop a long term solutions wh reflect best possible use for th

Materials	Continued and Additional Suggested Learning Experiences
g and lach d Use ce Agronomy,	Develop picture collection of good and poor land use. Conduct a Contest 1. Select a real piece of property within the the community which presents a future problem ie, gravel pit, swamp. Have students develop a long term solutions which will reflect best possible use for the community.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.

Discipline Area Indus

Subject: Draft

Problem Orientation Ma and re-engi

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: Students will be able to identify objects that are both functional & economic Affective: Students will observe and learn to save materials otherwise used to an excess Skills to be Learned A. Material useage B. Redesign C. Function	I. Student-Centered in class activity A. General concept. Include in the design the idea of the importance of using materials within limits. Usually there is too much material used for a given piece of construction. B. Students in engineering drafting can divide up the parts to save on excess materials. C. Redesign parts to use standard materials to cut down machine time and/or save assembly operations.

economic, social, and

ors determine status

s and attitudes

ironment.

Discipline Area Industrial Arts

Subject: Drafting

Problem Orientation Material useage and re-engineering Grade 9-12

BJECTIVES	SUGGESTED LEARNING EXPERIENCES	
nts will fy objects ctional ts will to save se used	I. Student-Centered in class activity A. General concept. Include in the design the idea of the importance of using materials within limits. Usually there is too much material used for a given piece of construction. B. Students in engineering drafting can divide up the parts to save on excess materials. C. Redesign parts to use standard materials to cut down machine time and/or save assembly operations.	II. Outside Resource and Community Activities A. Product engineer local manufacturer B. Forest Products Lab. (Wood Area)
ned e		

Resource and Reference Materials	Continued and Additional Suggested L
Publications: Drawing for Product Planning, George E. Stephenson Chas. A. Bennett Co., Inc. 1970 Mechanical Drawing, French & Svensen, McGraw Hill, 1966 Audio-Visual: (Metals) BAVI #2666 Design for ARC Welded Structures Community: Local Engineer	

...s	Continued and Additional Suggested Learning Experiences

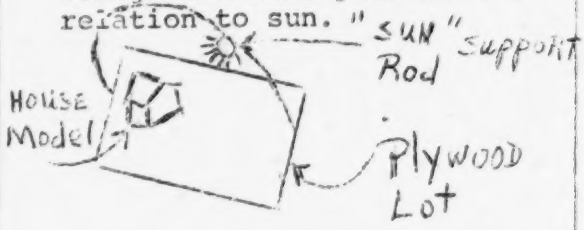
ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 9. Man has the ability to manage, manipulate, and change his environment.

Discipline Area Industria

Subject Drafting

Problem Orientation Sun En
Orient

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXP	II.
Cognitive: The student will locate a model home to take fullest advantage of the sun. Affective: The student will explain the advantages and values of proper house orientation with the sun. Skills to be Learned A. Placement of a house to use sun energy for heat and light. B. Saving of lighting costs. C. Saving of heating costs. D. Reading plot plans, maps, & azimuth charts.	I. Student-Centered in class activity Note - Model arrangement is used which included room modules to create given house design and home placement in relation to sun.  A. Have class discuss and try various arrangements for desired sun utilization. B. Explain zoning limitations. C. Present and explain azimuth-longitude charts.	

ge,

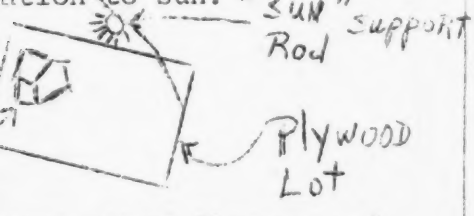
__ Discipline Area Industrial Arts

__ Subject Drafting - Arch.

__ Problem Orientation Sun Energy & Orientation Grade 11-12

SUGGESTED LEARNING EXPERIENCES

udent-Centered in class
tivity
te - Model arrangement
used which included room
ules to create given house
ign and home placement in
ation to sun.



Have class discuss and
try various arrangements
for desired sun utilization.
Explain zoning limitations.
Present and explain azimuth-
longitude charts.

II. Outside Resource and Community Activities
Local Architect

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Architecture Drafting & Design Hepler & Wallach, McGraw Hill, 1965 Audio-Visual: Teacher made model. Community: Local Architect.	Have students study their own and neig determine in how many cases the home o situated better.

rials	Continued and Additional Suggested Learning Experiences
gn l,	Have students study their own and neighbors homes to determine in how many cases the home could have been situated better.

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT

10. Short-term economic gains may produce long-term environmental losses.

Discipline Area Indu

Subject Draf

Problem Orientation P

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNI
Cognitive: The student will be able to make a working drawing of a project that fulfills a given set of needs. Affective: The student will be able to analyze a problem. Skills to be Learned A. Project planning 1. Problem analysis 2. Problem solving 3. Working drawing 4. Production B. Haste makes waste both time and material	I. Student-Centered in class activity A. Show film strip design in wood 2nd half. B. Have class select project to be designed. C. From class discussion develop list of "needs." 1. Where will it be used. 2. How will it be used. 3. What will it hold. 4. What materials. 5. What machines and/or tools available. 6. How much will it cost. D. Depending on group's ability have groups or individuals solve problem. E. Have class discuss and evaluate results.

gains

vironmental Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Project Planning Grade 7-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   A. Show film strip design in wood 2nd half.
   B. Have class select project to be designed.
   C. From class discussion develop list of "needs."
      1. Where will it be used.
      2. How will it be used.
      3. What will it hold.
      4. What materials.
      5. What machines and/or tools available.
      6. How much will it cost.
   D. Depending on groups ability have groups or individuals solve problem.
   E. Have class discuss and evaluate results.

II. Outside Resource and Community Activities
   A. Local product engineer
   B. Have students evaluate mass produced items as they differ from individualized items.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Drawing for Product Planning, George E. Stephenson, Chas. A. Bennett Co. 1970	
Audio-Visual: Film strip . Design in Wood, McGraw-Hill	
Community:	

ued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

Discipline Area Industr

Subject Drafti

Problem Orientation Savi and

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	II.
Cognitive: The student will understand the amount of time and materials necessary to produce a set of house plans. Affective: The student will make use of intermediates to save time and materials. Skills to be Learned Use of intermediate.	I. Student-Centered in class activity A. From a set of house plans, discover how many times the same basic drawing is used. 1. Floor plan 2. Electric plan 3. Heating plan 4. Plumbing plan 5. Joist layout 6. Sub-floor layout 7. Stud layout B. Discussion on quickest way to produce necessary prints. C. Demonstrate: Intermediates 1. Sepia 2. Eraseable sepia 3. Intensifier film 4. Eraseable intensifier film D. Through math calculation find the amount of paper and time saved through the use of an intermediate	

scipline Area Industrial Arts

bject Drafting - Arch.

oblem Orientation Saving of paper and time. Grade 11-12

SUGGESTED LEARNING EXPERIENCES

tered in class

et of house plans,
how many times
basic drawing is

plan
ric plan
ng plan
ing plan
layout
loor layout
layout
on on quickest
roduce necessary

ate:
iates

able sepia
ifier film
ole intensifier

ath calculation
amount of paper
saved through
f an intermediate

II. Outside Resource and Community Activities

Resource and Reference Materials	Continued and Additional Suggest
Publications: Professional Builder, Sept. 1970 Use of Detailed Layouts to Save On Site Cost	
Audio-Visual: Various intermediates, produced by instructor or previous students.	
Community:	

Continued and Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT		
C O N C E P T	12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.	Discipline Area Subject D Problem Orientati

BEHAVIORAL OBJECTIVES	SUGGESTED LEA
Cognitive: The student will be able to design a residential dwelling that conforms to local zoning laws. Affective: The student will realize the importance of zoning laws.	I. Student-Centered in class activity A. Presentation and class discussion by a representative of the local zoning committee B. Have students identify zoning laws which will affect their problem C. Students will realize from class discussion and debate how zoning laws protect the rights of others D. Evaluate finished plans in relationship to zoning laws. (local building inspector)
Skills to be Learned Zoning laws protect the rights of others	

ust be

and should

late the

cs.

Discipline Area Industrial Arts

Subject Drafting - Arch.

Problem Orientation Zoning laws Grade 11-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   A. Presentation and class discussion by a representative of the local zoning committee
   B. Have students identify zoning laws which will affect their problem
   C. Students will realize from class discussion and debate how zoning laws protect the rights of others
   D. Evaluate finished plans in relationship to zoning laws. (local building inspector)

II. Outside Resource and Community Activities
   A. Zoning Committee Rep.
   B. Local Building Inspector

Resource and Reference Materials	Continued and Addition
Publications: General Architectural Drawing, William B. Wyatt, Chas. Bennett Co. 1969. Architecture Drafting and Design, Hepler & McGraw Hill 1965 Soil Surveys and Land Use Planning, Soil Science Society of America & American Society of Agronomy, 1966 Audio-Visual: Community: Zoning Commission Representative Local Building Inspector	

ontinued and Additional Suggested Learning Experiences

CONCEPT		
1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.	Discipline Area	Industri
	Subject	Woods
	Problem Orientation	How

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	II.
Cognitive: The student will produce a list of 5 conditions which will result in optimum tree growth. Affective: The student will be able to recognize factors which positively and/or negatively affect tree growth and quality. Skills to be Learned 1. Selective cutting 2. Maximum growth 3. Annual Rings pattern (how related to grain pattern) 4. Proper methods of tree placement in planting for greatest growth.	I. Student-Centered in class activity A. Slide presentation showing trees grown in different situations B. Discussion on presentation 1. Which trees showed greatest growth-why. 2. Why didn't other trees show same progress? a. Density of growth area. b. Tree management,etc. C. Offer actual samples for comparison 1. Densily planted vs. sparsely planted area (shade effects) 2. Growth of pruned tree vs. neglected tree. D. Present: (Outside resource) Strength of lumber in relation to growth conditions. E. Open discussion- tree growth as observed by students.	

asic

rted Discipline Area Industrial Arts

nto Subject Woods

se for Problem Orientation How a tree grows Grade 7-12

SUGGESTED LEARNING EXPERIENCES

tudent-Centered in class ctivity

. Slide presentation showing trees grown in different situations
. Discussion on presentation
  1. Which trees showed greatest growth-why.
  2. Why didn't other trees show same progress?
     a. Density of growth area.
     b. Tree management,etc.
. Offer actual samples for comparison
  1. Densily planted vs. sparsely planted area (shade effects)
  2. Growth of pruned tree vs. neglected tree.
. Present: (Outside resource) Strength of lumber in relation to growth conditions.
. Open discussion- tree growth as observed by students.

II. Outside Resource and Community Activities

1. Forester
2. Lumber dealer or representative

Resource and Reference Materials	Continued and Ad
Publications: Life of The Forest, Jack McCormick MeGraw-Hill Woodworking for Industry, John L. Feirer, Chas. A. Bennett Co. Audio-Visual: 1. Teacher made slide series 2. Sample collection 3. Paper Makes Wis. Great, Rroject I-C-E-,Filmstrip, Teachers guide Community: Forester Lumber Dealer	F. Have studen growth condi G. Suggest and conditions.

ce Materials	Continued and Additional Suggested Learning Experiences
Jack McCormick stry, John L. nett Co. e series Great, lmstrip,	F. Have students inspect own area for tree growth conditions. G. Suggest and carry out methods of improving local conditions.

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT 2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline Area Indust

Subject Woods

Problem Orientation Cle

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING	I
Cognitive: The student will clean-up when the clean-up period arrives, and not only completed his responsibility but also check overall results against class developed standard.. Affective: The student will understand all living systems interact among themselves and their environment, realizing clean-up is a combined effort, not an effort by an individual. Skills to be Learned 1. Co-operation 2. Responsibility 3. Benifits of clean-up A. Neater work B. Equipment in proper place. C. Better working atmosphere D. Safer place to work	I. Student-Centered in class activity A. Let clean-up go for one day B. Allow students to work 2nd day in messy area C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilities stressing teamwork. E. Discuss and compare results of clean-up vs. no clean-up and discuss group inter-action as it relates to clean-up.	

scipline Area Industrial Arts

bject Woods

oblem Orientation Clean-Up Grade 7-12

SUGGESTED LEARNING EXPERIENCES

ered in class

-up go for one

dents to work
n messy area
on 3rd day the
clean-up and
t to the shop
on and environ-

schedule of
nd responsibilities
g teamwork.
and compare
of clean-up vs.
-up and discuss
ter-action as it
to clean-up.

II. Outside Resource and Community Activities

1. Field trip to local manufacturing area to view practical applications and advantages of neatness and cleanliness
2. Presentation by industrial commission representative on safety and production as related to neatness and teamwork

Resource and Reference Materials	Continued and Additional Suggest
Publications: Woodworking for Industry John L. Feirer Chas. A. Bennett Co. Modern Carpentry, Willis H. Wagner, Goodheart-Wilcox General Shop Woodworking, Fryklund & LaBerge McKnight & McKnight. Audio-Visual: Industrial Arts: A Safe Shop University of Ill. Community: Safety Inspector Industrial Commission	1. Develop methods of making cl more efficient. 2. Develop list on where else a would be beneficial.

ued and Additional Suggested Learning Experiences

velop methods of making clean-up responsibility
re efficient.

velop list on where else a team clean-up effort
uld be beneficial.

ESEA Title III -59-700135-2 Project I-C-E

CONCEPT

3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

Discipline Area Industria

Subject Woods

Problem Orientation Crowdi Shop

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE
Cognitive: The student will list and explain three physical and three psychological effects of environmental crowding and relate them to specific shop areas. Affective: The student will realize that crowding results in adverse physical and psychological conditions. Skills to be Learned Hazards in environmental crowding.	I. Student-Centered in class activity A. Conduct experiment around following conditions: 1. Develop simple task ie, saw off lumber layout and drill 4 holes. 2. Provide only one each of tools required 3. Limit work area to one table. 4. Limit time. 5. Mass production not allowed. 6. First three done win. B. Discuss personal & physical feelings experienced during experiment. 1. Low production 2. Confusion 3. Frustration 4. Irritability 5. Waste 6. Injury C. What happens if this happened in town?	II. Ou Co 1. 2. 3.

miting

ing Discipline Area Industrial Arts

ach Subject Woods

city. Problem Orientation Crowding in the Shop Grade 7-12

SUGGESTED LEARNING EXPERIENCES

udent-Centered in class tivity

Conduct experiment around following conditions:

1. Develop simple task ie, saw off lumber layout and drill 4 holes.
2. Provide only one each of tools required
3. Limit work area to one table.
4. Limit time.
5. Mass production not allowed.
6. First three done win.

Discuss personal & physical feelings experienced during experiment.

1. Low production
2. Confusion
3. Frustration
4. Irritability
5. Waste
6. Injury

What happens if this happened in town?

II. Outside Resource and Community Activities

1. Psychologist
2. Community Planning Committee.
3. Real Estate Developer

Resource and Reference Materials	Continued and Additional Suggest
Publications:	D. Relate results experienced du concept #3.
Audio-Visual: #53525 Man's Effect on The Environment, University of Ill. Champaign, Ill.	
Community: 1. Psychologist or Sociologist 2. Community Planning Committee 3. Real Estate Developer	

d and Additional Suggested Learning Experiences
e results experienced during experiment to
pt #3.

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT 4. An adequate supply of pure water is essential for life.

Discipline Area Inc

Subject Woo

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
Cognitive: The student will be able to list five advantages of planting and cutting to control water run off. Affective: The student will understand how to control water run off. Skills to be Learned 1. Selective cutting can control water run off. 2. Reforestation practices 3. Run-off control minimizes stream pollution	I. Student-Centered in class activity 1. Class discussion centered around film strips and/or locally produced slides, showing difference of wat run off on properly cut and planted versus improp erly cut and planted. 2. Discussion by local fores er about how selective cu ing can control run off and improve tree stand (possible field trip) 3. Follow-up. Run tests of lakes and streams with and without protection of trees and evaluate results. Question: Would reforest ation minimize problem?

Discipline Area Industrial Arts

Subject Woodworking

Problem Orientation Control of Water Run-Off Grade 7-12

SUGGESTED LEARNING EXPERIENCES

-Centered in class

discussion centered
d film strips and/or
ly produced slides,
ng difference of water
ff on properly cut
lanted versus improp-
cut and planted.
ssion by local forest-
out how selective cutt-
an control run off
mprove tree stand
ible field trip)
w-up.
ests of lakes and
ms with and without
ction of trees and
ate results.
ion: Would reforest-
minimize problem?

II. Outside Resource and Community Activities
1. Planting trees
2. Helping in selective cutting
3. Long term--check on water quality as checked by planting
4. Long term--photograph
5. Student developed slide series of local conditions
6. Field trip with local forester

Resource and Reference Materials	Continued and additional Suggested
Publications:	1. Revegetate a stream (under dire Dept.) to control water run-of 2. Clean out a local stream.
Audio-Visual: Teacher/student developed slide series #01893 Forest Products University of Ill, Champaign, Ill.	
Community: 1. DNR 2 ASCS	

d and additional Suggested Learning Experiences

getate a stream (under direction of Conservation
.) to control water run-off.

n out a local stream.

CONCEPT

5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area Indus

Subject Woodw

Problem Orientation R
Clean Ai

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The student will be able to list five health hazards due to air pollution in a woodworking shop. Affective: The student will take preventive measures to stop air pollution when working with wood. Skills to be Learned Ways to reduce air pollution in a shop environment.	I. Student-Centered in class activity A. Dust collection system will not be used for a one day period to show students how dust will collect on projects, clothes, tools and machines. B. During next working period dust collector will be used and students will observe difference in working conditions. C. Student-small group, busy session.

of clean

e most

gen, through

the energy

Discipline Area Industrial Arts

Subject Woodworking

Problem Orientation Relationship of Clean Air to Health

Grade 7-12

SUGGESTED LEARNING EXPERIENCES	
I. Student-Centered in class activity A. Dust collection system will not be used for a one day period to show students how dust will collect on projects, clothes, tools and machines. B. During next working period dust collector will be used and students will observe difference in working conditions. C. Student-small group, busy session.	II. Outside Resource and Community Activities Inspector from State Dept. of Labor, Management and Human Relations.

Resource and Reference Materials	Continued and Addition
Publications:	
Audio-Visual:	
Community: Local Representative of Dept. of Labor, Management and Human Relations.	

ls	Continued and Additional Suggested Learning Experiences
of	

CONCEPT

6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area: Industr

Subject: Woods

Problem Orientation: Lumbe

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	II.
Cognitive: Student will research, create, and compare itemized cost sheets of lumber 20 years ago, 10 years ago, and the present time. Students will then present their findings to the class via oral report and visual aid. Affective: Student will be able to see monetary effect of diminishing resources and resource location in the lumbering industry. Skills to be Learned 1. Cost analysis 2. Timber forest and lumbering locations 3. Graphic illustrations 4. Cause-effect thinking	I. Student-Centered in class activity A. Discuss cost sheets 1. What is included 2. Format B. Have students compile cost sheets of 20,10, and 1 year ago for a standard article in local area C. Discuss local area cost sheets, comparing cost fluctuations and probable causes over the years. 1. Availability 2. Forest management 3. Demand 4. Additional expenses D. Compare and discuss: Local area cost sheets versus cost sheets from other geographical area. (teacher furnished) Discuss reasons for variations. 1. Location 2. Transportation (Con't)	

t equally

r over Discipline Area Industrial Arts

geo- Subject Woods

ty of Problem Orientation Lumber Cost Increases Grade 7-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

A. Discuss cost sheets
   1. What is included
   2. Format

B. Have students compile cost sheets of 20,10, and 1 year ago for a standard article in local area

C. Discuss local area cost sheets, comparing cost fluctuations and probable causes over the years.
   1. Availability
   2. Forest management
   3. Demand
   4. Additional expenses

D. Compare and discuss: Local area cost sheets versus cost sheets from other geographical area. (teacher furnished) Discuss reasons for variations.
   1. Location
   2. Transportation

(Con't)

II. Outside Resource and Community Activities
   1. D.N.R. Representative
   2. Forest manager
   3. Local lumber dealer
   4. Contractor

Resource and Reference Materials	Continued and Additiona
Publications: Catalogs from lumber dealers. Woodworking for Industry, John L. Feirer, Chas. A Bennett Co. General Shop Woodworking, FryKlund & La Berge, McKnight & McKnight Audio-Visual: Community: Local lumber dealers	(Con't from D) 3. Forest management 4. Demand

ls	Continued and Additional Suggested Learning Experiences
t Co lund t	(Con't from D) 3. Forest management 4. Demand

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT

7. Factors such as facilitating transportation, economic conditions population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Industri

Subject Woodwork

Problem Orientation Leis

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING	II.
Cognitive: The student will be able to list 10 new businesses and industries created by the do-it-yourself concept. Affective: The student will make better use of his leisure time through the use of do-it-yourself woodworking projects. Skills to be Learned Efficient use of leisure time. Research.	I. Student-Centered in class activity A. Students will research how the do-it-yourself leisure activities have changed industries, transportation, and population centers, by means of: 1. Personal interview-local industrialist, businessmen, etc. 2. Magazine/newspaper reading. 3. Books. 4. A-V materials. 5. Letters of inquiry to various companies. 6. Small-group brainstorming.	

ons Discipline Area Industrial Arts

Subject Woodworking

nce Problem Orientation Leisure Time Grade 9-12
rs

SUGGESTED LEARNING EXPERIENCES

ent-Centered in class
vity
tudents will research
ow the do-it-yourself
eisure activities have
hanged industries,
ransportation, and pop-
lation centers, by
eans of:
. Personal interview-
local industrialist,
businessmen, etc.
. Magazine/newspaper read-
ing.
. Books.
. A-V materials.
. Letters of inquiry to
various companies.
. Small-group brain-
storming.

II. Outside Resource and Community Activities
Local building supply dealers.
Operators of craft and hobby shops.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Do-It-Yourself Encyclopedia Project plan books Magazines, Better Homes & Gardens, etc.	
Audio-Visual:	
Community: Local building supply dealer. Local hobby & craft shop personal.	

nd Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT		
8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.	Discipline Area	Industrial
	Subject	Woods
	Problem Orientation	Economic materi

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXP	
Cognitive: The student will resaw lumber for his project whenever possible. Affective: The student will realize that resawing lumber for panels saves not only materials but also money thus minimizing waste. Skills to be Learned 1. Use of the bandsaw for resawing 2. Project planning for resawing.	I. Student-Centered in class activity A. Class discussion of how can the material we use in the shop be used most economically in the following areas: 1. Project design (Standard Material) 2. Material Layout (Minimize waste) 3. Reworked material (Resawing) B. Bandsaw demonstration 1. Resawing A. Blade width B. Fence C. Feather board 2. Handling resawed mat'rl A. Gluing & clamping B. Surfacing 3. Design alternatives with resawed mat'rl	II. O Co A. B.

l, and

status Discipline Area Industrial Arts

s Subject Woods

Problem Orientation Economic use of material Grade 8-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

A. Class discussion of how can the material we use in the shop be used most economically in the following areas:
   1. Project design (Standard Material)
   2. Material Layout (Minimize waste)
   3. Reworked material (Resawing)

B. Bandsaw demonstration
   1. Resawing
      A. Blade width
      B. Fence
      C. Feather board
   2. Handling resawed mat'rl
      A. Gluing & clamping
      B. Surfacing
   3. Design alternatives with resawed mat'rl

II. Outside Resource and Community Activities

A. Local shop owners talk about reusable material in their business.

B. Chamber of Commerce list of areas businesses Student evaluate which produce the "most useless" wastes.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Woodworking for Industry, John L. Feirer Chas. A. Bennett Co. Exploring Woodworking, Fred W. Zimmerman Goodheart-Willcox Audio-Visual: BAVI #2640 Danish Design #03230 Man and The Forest, Part 1 #03370 Man and the Forest, Part 2 University of Ill.	

and Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project I=C-E

CONCEPT

9. Man has the ability to manage, manipulate, and change his environment.

Discipline Area Ir

Subject Wo

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
Cognitive: The student will be able to graph how a tree will produce immensely more under growing conditions manipulated by man. Affective: The student will be able to plant, and care for trees in a manner which will produce maximum growth.	I. Student-Centered in class activity A. Presentation by the D.N.R on how man is manipulatin the environment in which a tree grows to produce maximum yield.
Skills to be Learned How to produce trees that will yield maximum material in the shortest growing time possible.	

Discipline Area Industrial Arts

Subject Woodworking

Problem Orientation Super Trees Grade 9-12

SUGGESTED LEARNING EXPERIENCES

nt-Centered in class
.ty
esentation by the D.N.R.
how man is manipulating
e environment in which
tree grows to produce
ximum yield.

II. Outside Resource and Community Activities
A. Field trip to an area such as the:
1. Seed Orchard
2. Nicolet National Forest, East of Langlade, Wis. Highway 64.
3. Tree farms operated by paper mills and lumber companies
B. D.N.R.

Resource and Reference Materials	Continued and Additional Sugge
Publications: Exploring Woodworking, Fred W. Zimmerman Goodheart-Willcox General Shop Woodworking, FryKlund & LaBerge McKnight & McKnight Woodworking for Industry, John L. Feirer Chas. A. Bennett Co. Audio-Visual: # 52386 Conservation in Our Forest #01889 Forest Conservation, University of Ill. Champaign, Ill. Community: D.N.R.	

Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT: 10. Short-term economic gains may produce long-term environmental losses.

Discipline Area: Indus

Subject: Woods

Problem Orientation: qu

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The student will list 10 conditions which effect the quality of a saw log. Affective: The student will become aware of the adverse effects of cutting for pure profit.	I. Student-Centered in class activity A. Develop a collection of boards which contain defects which effect the grade of the board 1. Natural defects a. Knots b. Wanes c. Shakes d. Natural holes e. Staining 2. Man made defects a. Splits b. Cracking c. Checking d. Honeycombing e. Caseharding f. Man made holes g. Staining B. Discuss what happened to cause the various defects. C. Were these defects a result of "Rushing?" (Con't)
Skills to be Learned Forest management A. Selective cutting B. Proper pruning or trimming C. Use of a crushing stick	

ns may

tal

Discipline Area Industrial Arts

Subject Woods

Problem Orientation Production of quality saw logs Grade 7-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

A. Develop a collection of boards which contain defects which effect the grade of the board
   1. Natural defects
      a. Knots
      b. Wanes
      c. Shakes
      d. Natural holes
      e. Staining
   2. Man made defects
      a. Splits
      b. Cracking
      c. Checking
      d. Honeycombing
      e. Caseharding
      f. Man made holes
      g. Staining

B. Discuss what happened to cause the various defects.

C. Were these defects a result of "Rushing?" (Con't)

II. Outside Resource and Community Activities

Resource and Reference Materials	Continued and Additional Sugg
Publications: Woodworking for Industry, John L. Feirer Chas. A. Bennett Co. Exploring Woodworking, Fred W. Zimmerman Goodheart-Willcox Cabinetmaking & Millwork, John L. Feirer Chas. A. Bennett Co. Audio-Visual: #81995 Working Forest University of Ill. Teacher developed slides. Community: Local forester	(Con't from I.) D. How can growing quality E. Presentation by local fo F. Develop slide series of the "quick buck" VS. cut

nued and Additional Suggested Learning Experiences

t from I.)

low can growing quality be controlled?

Presentation by local forest ranger.

Develop slide series of wood lots--cut for the "quick buck" VS. cut for management.

CONCEPT			
	11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.	Discipline Area	Industri
		Subject	Woods
		Problem Orientation	Mater Waste

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	
Cognitive: The student will select material and work with it in a manner that results in minimum or zero waste. Affective: The student will realize that efficient use and careful workmanship reduces waste and results in savings. Skills to be Learned 1. Efficient use of materials 2. Working allowance A. Hand tools B. Machine 3. Multiplied waste 4. Multiplied carelessness. (scrap/rejects)	I. Student-Centered in class activity A. Class discussion of working allowance (Poem) "Half an inch longer 'tis we saw Quarter of an inch wider is the law An eighth on thickness is enough Where sawing lumber from the rough." B. Students will lay-out assigned projects on paper representing 4x8 plywood calculate % of waste C. Discuss waste multiplier for both boards versus plywood--% of rejects D. Students will go to local lumber yard and obtain price lists to realize the amount of money spent for waste.	II.

Discipline Area Industrial Arts

Subject Woods

Problem Orientation Material Use Vs. Waste Grade 7-12

SUGGESTED LEARNING EXPERIENCES

Centered in class

discussion of
ng allowance
Poem)
an inch longer 'tis
aw
er of an inch wider
he law
ghth on thickness
nough
sawing lumber
the rough."
nts will lay-out
ned projects on
representing
lywood calculate
waste
ss waste multiplier
oth boards versus
od---% of rejects
nts will go to local
r yard and obtain
lists to realize
mount of money
for waste.

II. Outside Resource and Community Activities
A. Quality control engineer
B. D.N.R.---wood use

Resource and Reference Materials	Continued and Additional Sugges
Publications: Woodworking for Industry, John L. Feirer Chas. A. Bennett Co. Cabinetmaking and Millwork, John L. Feirer Chas. A. Bennett Co. Exploring Woodworking, Fred W. Zimmerman Goodheart-Willcox Audio-Visual: #50750 American Sawmill #03230 Man and The Forest Part 1, University of Ill. Community: Quality control engineer D.N.R.	1. Students will redesign proj materials thereby, freeing uses.

terials	Continued and Additional Suggested Learning Experiences
	1. Students will redesign projects to use less materials thereby, freeing materials for other uses.

ESEA Title III -55-70-0135-2 Project I-C-II

CONCEPT

12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others,

Discipline Area In

Subject Ho

Problem Orientatio

BEHAVIORAL OBJECTIVES	SUGGESTED LEAR
Cognitive: The student will develop and defend a code or law for a given tract of land which reflects "proper" land use. Affective: The student will know how building codes and zoning laws affect and dictate land use. Skills to be Learned 1. Zoning laws. 2. Building Codes. 3. Proper Land Use.	I. Student-Centered in class activity A. Discuss how building codes & zoning laws dictate land use 1. Land Use (type of are a. Commercial b. Residential c. Recreational 2. Building placement 3. Building spacing B. Discuss reasons behind building code regulation 1. How do they benefit people? a. Planners b. Builders c. Residents 2. How do they hinder people? a. Planners b. Builders c. Residents C. Discuss correlation betw good building codes and zoning laws and good res environmental and ecologi conditions.

rded

Discipline Area Industrial Arts

Subject Woods - Building Trades

Problem Orientation Building Codes & Zoning Laws Grade 9-12

SUGGESTED LEARNING EXPERIENCES

t-Centered in class

ty

cuss how building
es & zoning laws
tate land use
Land Use (type of area)
a. Commercial
b. Residential
c. Recreational
Building placement
Building spacing
cuss reasons behind
lding code regulations.
How do they benefit
people?
a. Planners
b. Builders
c. Residents
How do they hinder
people?
a. Planners
b. Builders
c. Residents

cuss correlation between
d building codes and
ing laws and good resulting
ironmental and ecological
ditions.

II. Outside Resource and Community Activities

A. Local Govt. official to explain reasoning behind codes & zoning
B. Zoning commissioner, town or village official
C. Local building inspector
D. Architect
E. Local contractor
F. Safety & sanitation inspector
G. N.D.R. Representatives and films concerning "before & after development"

Resource and Reference Materials	Continued and Additional Sugge
Publications: Modern Carpentry, Willis H. Wagner Goodheart-Willcox Architecture Drafting and Design Hepler & Wallach, McGraw Hill Audio-Visual: Rural Cities: How They Grow University of Ill. Community: All sources listed under "Outside Resources and Community Activities" on reverse side.	Develop easy reference chart codes and zoning laws.

terials	Continued and Additional Suggested Learning Experiences
	Develop easy reference chart for basic building codes and zoning laws.
d Design Hill	
row	
mmunity de.	

ESEA Title III -59-70-0135-2 Project I-C-I

CONCEPT

1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area In

Subject He

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
Cognitive: The student will be able to explain, in writing, how oxygen is used in the welding and cutting process. Affective: The student will understand the use of oxygen in the welding and cutting process. Skills to be Learned How oxygen is produced. How oxygen is used in the welding process.	I. Student-Centered in class activity A. Class discussion on how oxygen is produced in nature through photo-synthesis and commerciall through electrolysis. B. Experiment showing how a candle will burn in the presence of oxygen and go out as oxygen is used. C. Relate experiment to flam cutting process. D. Develop relation of electrolysis to sun energy

the sun, the

all energy, is

gh plant photosyn-

orm all living things
e processes.

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Oxygen ProductionGrade9-12

CTIVES	SUGGESTED LEARNING EXPERIENCES	
nt ain, en ng nt use ding	I. Student-Centered in class activity A. Class discussion on how oxygen is produced in nature through photo-synthesis and commercially through electrolysis. B. Experiment showing how a candle will burn in the presence of oxygen and go out as oxygen is used. C. Relate experiment to flame cutting process. D. Develop relation of electrolysis to sun energy?	II. Outside Resource and Community Activities Local welding supply house.
ed. n the		

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: Available from welding supply houses for the asking: Oxyacetylene Welding and Cutting, Stuart Plumley McGraw Hill Audio-Visual: Flame Charts Community: Rep. from local welding supply house.	

ials	Continued and Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT

2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline Area Indust

Subject Metals

Problem Orientation C

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will clean-up when the clean-up period arrives, and not only do his responsibility but also check overall results. Affective: The student will understand all living systems interact among themselves & their environment realizing clean-up is a combined effort not an effort by an individual. Skills to be Learned 1. Cooperation 2. Responsibility 3. Benefits of clean-up A. Neater work B. Equip. in proper place. C. Better working athmosphere D. Safer place to work.	I. Student-Centered in class activity 1. Let clean-up go for one day. 2. Allow students to work next day in messy area. 3. Evaluate on third day the need for clean-up and relate to shop production and environment. 4. Organize schedule of duties and responsibilities stressing reamwork 5. Discuss and compare results of clean-up versus no clean-up and group interaction as related to clean-up.

interact

r

ntricate

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Clean-up Grade 7-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   1. Let clean-up go for one day.
   2. Allow students to work next day in messy area.
   3. Evaluate on third day the need for clean-up and relate to shop production and environment.
   4. Organize schedule of duties and responsibilities stressing reamwork
   5. Discuss and compare results of clean-up versus no clean-up and group interaction as related to clean-up.

II. Outside Resource and Community Activities
   1. Field trip to local manufacturing area to view practical applications and advantages of neatness and cleanliness.
   2. Presentation by industrial commission representative on safety & production as related to neatness & teamwork.

Resource and Reference Materials	Continued and Additiona
Publications: Metalwork Technology and Practice, Ludwig & McCarthy McKnight & McInight Forging & Welding, Robert E. Smith McKnight & McInight Metalworking, T. Gardner Boyds Audio-Visual: Industrial Arts: A Safe Shop, University of Ill. Community: Safety inspector industrial commission.	1. Develop methods of responsibility mo 2. Develop list of p clean-up effort w

nued and Additional Suggested Learning Experiences

Develop methods of making clean-up responsibility more efficient.

Develop list of places where a team clean-up effort would be beneficial.

C O N C E P T	3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

BEHAVIORAL OBJECTIVES	
Cognitive: The student will list and explain 3 physical and 3 psychological effects of environmental crowding and relate them to specific areas. Affective: The student will realize that crowding results in adverse physical & psychological conditions. Skills to be Learned Hazards in environmental crowdir~.	I. Student-Cent activity 1. Conduct e around fo condition A. Develo ie. sa layout holes B. Provid each o C. Limit one ta D. Limit E. Mass p allowe F. First win 2. Discuss p feelings experiment A. Low pro B. Confusi C. Frustra D. Irritab E. Waste (Con't)

are

organisms Discipline Area Industrial Arts

nce, Subject Metals

a Problem Orientation Crowding in Shop Grade 7-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   1. Conduct experiment around following conditions:
      A. Develop simple task ie. saw off stock layout & drill 4 holes
      B. Provide only one each of tools required
      C. Limit work area to one table
      D. Limit time
      E. Mass production not allowed
      F. First three finished win
   2. Discuss personal & physical feelings experienced during experiment.
      A. Low production
      B. Confusion
      C. Frustration
      D. Irritability
      E. Waste

(Con't)

II. Outside Resource and Community Activities
   1. Psychologist
   2. Community planning committee
   3. Real estate developer

Resource and Reference Materials	Continued and Additional
Publications:	(Con't from I.) 3. What happens if this h A. Slums B. Urban crowding 4. Relate experienced res
Audio-Visual: #53525 Man's Effect on The Environment, University of Ill., Champaign, Ill.	
Community: Psychologist or Socialogist. Community planning comm. Real estate developer	

nd Additional Suggested Learning Experiences
I.)
pens if this happened in town?

crowding
xperienced results to concept #3.

CONCEPT

4. An adequate supply of pure water is essential for life.

Discipline Area Industrial

Subject Metals

Problem Orientation Pure Wa
Manufac

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE	II. Ou
Cognitive: The student will be able to list 5 methods in which waste water is treated in the metals industry. Affective: The student will understand how waste water in metal manufacturing is processed to purify it to standards. Skills to be Learned 1. How water is used in manufacturing 2. How waste water quality is maintained 3. Water quality standards	II. Student-Centered in class activity A Field trip to gain knowledge of water use in manufacturing. B Group discussion 1. How water used in the manufacture & processing of metals? 2. Is the water "pure" when you are finished with it? 3. (Yes) What is being done to accomplish this? 4. (No) What can be done to accomplish this? 5. Is water recycled thru the process or only used once---why? 6. Is water sent thru local sewage treatment plant? Why-Why not?	Co A. B. C. D.

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Pure Water & Manufacturing Grade 7-12

SUGGESTED LEARNING EXPERIENCES

nt-Centered in class
ity
ld trip to gain
wledge of water use
manufacturing.
up discussion
How water used in
the manufacture &
processing of metals?
Is the water "pure"
when you are finished
with it?
(Yes) What is being
done to accomplish
this?
(No) What can be done
to accomplish this?
Is water recycled thru
the process or only
used once---why?
Is water sent thru
local sewage treatment
plant? Why-Why not?

II. Outside Resource and Community Activities
A. Visit local plants & see how water is used in processing and/or manufacturing of metal.
B. Visit local sewage treatment plant & have engineer explain problems related to treatment of industrial waste.
C. D.N.R. representative
D. Chemistry inst.

Resource and Reference Materials	Continued and Additional Suggested Learn	d Addit
Publications: Forging and Welding, Robert E. Smith McKnight & McKnight. Metalwork Technology & Practice, Oswald A. Ludwig McKnight & McKnight Audio Visual: Community: 1. D.N.R. 2. Local sewage engineer. 3. Local manufacturer large quantities of water.	1. Students will write and report on wa treatment process. Be prepared to ex effects of water moving different so testing the results. 2. Set up a model sediment pond using t contrasting soils ie. sand, gravel, Test the purity of the water before piercing thru soil.	will w t proce of wate the res model ing soi purity thru s

Additional Suggested Learning Experiences

ill write and report on water
process. Be prepared to explain
water moving different soils &
e results.
odel sediment pond using three
g soils ie. sand, gravel, & clay.
urity of the water before & after
hru soil.

CONCEPT 5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area Indust

Subject Metals

Problem Orientation Dea Weldin

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will express in writing the toxic effects of the fumes produced in welding. Affective: The student will turn on the exhaust system before welding, realize what ideal conditions are desired, use conservatively. Skills to be Learned 1. Effects of welding fumes on an individual. 2. How toxic fumes are handled in industry. 3. How toxic fumes are & can be handled in the shop.	I. Student-Centered in class activity A. Demonstrate various welding techniques & observe visible fumes produced. B. Discuss where these fumes come from, & what their effect is on an individual. (Guest speaker if desired) C. Have member of industrial commission explain how such fumes are dealt with in industry. D. Discuss & brainstorm how fumes can be dealt with in the school shop area.

lean air

organisms Discipline Area Industrial Arts

respiration, Subject Metals

heir Problem Orientation Dealing With Toxic Welding Fumes Grade 9-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   A. Demonstrate various welding techniques & observe visible fumes produced.
   B. Discuss where these fumes come from, & what their effect is on an individual. (Guest speaker if desired)
   C. Have member of industrial commission explain how such fumes are dealt with in industry.
   D. Discuss & brainstorm how fumes can be dealt with in the school shop area.

II. Outside Resource and Community Activities
   A. Industrial Commission representative.
   B. School chemistry teacher.
   C. Local welding or metal fabricating person.

Resource and Reference Materials	Continued and Additional
Publications: Forging and Welding, Robert E. Smith, McKnight & McKnight Oxyacetylene Welding and Cutting, Stuart & Plumley McGraw Hill Audio-Visual: Oxyacetylene Welding: Safety and Operations #53445 University of Ill. Community: Industrial Commission Rep. School chemistry teacher Local welder Local welding supplier	

nued and Additional Suggested Learning Experiences

ESEA Title III -59-70-0135-2 Project I-C-E

CONCEPT

6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area In

Subject Met

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
Cognitive: The students will be able to identify 5 adverse conditions created by strip mining. Affective: Students will become aware of how strip mining affects geographic conditions. Skills to be Learned 1. Ecological management of strip mining. 2. Methods of mining raw ore & its effect on our environment.	I. Student-Centered in class activity A. Research the following aspects of strip mining 1. Site selection 2. Site development 3. Community involvement 4. Side effects a. Physical b. Social c. Mental B. Field trip and/or movie/ film strip/slides to experience how strip mines are being "Re-cycle for better land use. C. Discuss effects of mining in relationship to commun ity. 1. How these materials help us? 2. How present mining techniques destroy natural environment. 3. Possible alternatives and/or improved proces

are not

ver the earth

tly affect

ions and

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Strip mining & its effects

Grade 7-12

S	SUGGESTED LEARNING EXPERIENCES	
ill	I. Student-Centered in class activity A. Research the following aspects of strip mining 1. Site selection 2. Site development 3. Community involvement 4. Side effects a. Physical b. Social c. Mental B. Field trip and/or movie/ film strip/slides to experience how strip mines are being "Re-cycled" for better land use. C. Discuss effects of mining in relationship to community. 1. How these materials help us? 2. How present mining techniques destroy natural environment. 3. Possible alternatives and/or improved processes.	II. Outside Resource and Community Activities A. Field trip to open pit and/or strip mine to see mining operations and to question about land reclamation. B. Library research C. D.N.R.

Resource and Reference Materials	Continued and Additional S
Publications: Forging and Welding, Robert E. Smith McKnight & McKnight Encyclopedias Audio-Visual: Mining for Nickel, Rothacker Motion Picture 241 W. 17th St., New York, N. Y. Continuous Excavating, New Concept in Mining More, Bigger, Deeper Blast Hole Drills , Ideal Pictures 4431 W. North , Milwaukee, Wis. Community: 1. D.I.R. 2. Local strip mine	1. Develop slide series a "Good vs Bad" strip mi

Materials	Continued and Additional Suggested Learning Experiences
	1. Develop slide series and/or picture set of "Good vs Bad" strip mining.

re
ork, N. Y.

last
ctures
kee, Wis.

ESEA Title III -52-70-0135-2 Project I-C-H

CONCEPT		
	7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.	Discipline Area I Subject Problem Orientatio

BEHAVIORAL OBJECTIVES	SUGGESTED LEA
Cognitive: The student will be able to list new businesses and industries created by the do-it-yourself concept & more available leisure time. Affective: The student will make better use of his leisure time through the use of do-it-yourself projects. Skills to be Learned 1. Efficient use of leisure time. 2. How leisure time effects land use.	I. Student-Centered in class activity A. Students will research how the do-it-yourself & leisure activities have changed industries transportation & population centers. B. Discuss how the sale of RV's have made an impact on the metals industry. C. What role is industrial arts providing in basic skills for the do-it-yourself concept--specifically in metals area?

uch as facilitating

, economic conditions , Discipline Area Industrial Arts

owth, and increased Subject Metals

ave a great influence Problem Orientation Leisure Time Grade 7-12
land use and centers Effects Land Use
density.

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
dent st by il- dent ie e -	I. Student-Centered in class activity A. Students will research how the do-it-yourself & leisure activities have changed industries, transportation & population centers. B. Discuss how the sale of RV's have made an impact on the metals industry. C. What role is industrial arts providing in basic skills for the do-it-yourself concept--specifically in metals area?	II. Outside Resource and Community Activities A. Local building supply dealer. B. Local recreational vehicle dealer, ie 1. Pickups 2. Snowmobiles 3. Minibikes 4. ATV's 5. Boats
ed f e .		

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Modern Projects in Wood, Metal and Plastic, Patrick E. Spielman Bruce Publishing Do-It-Yourself Encyclopedias	
Audio-Visual:	
Community: Local building supply dealer. Local recreational vehicle dealer.	

tinued and Additional Suggested Learning Experiences

ESEA Title III 69-70-0135-2 Project I-C-E

THEOREM	8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.	Discipline Area Indus Subject Metal Problem Orientation Th Of

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The students will create a flow chart pointing out the effects & conflicts in cultural, economic, social, & political areas brought about by a metal-industry problem Affective: The student will realize the cultural, economic, social, & political interactions brought about by a problem in the metal-working industry. Skills to be Learned 1. Cause & effect thinking 2. Political processes 3. Economics of change	I. Student-Centered in class activity A. Discuss local or widely known pollution problem pertaining to metals industry, ie: 1. Water pollution-- Lake Superior 2. Noise pollution-- Foundry 3. Air pollution - Foundry, steel mill B. Either- 1. Have open discussion as to what effects an attempt to clear up a pollution problem has on each aspect of society, ie, Society gets excited, fires up politicans, they chase industry, try to force change. Products prices go up to meet increase, etc. -or- 2. Organize round table discussion between (con't)

Discipline Area Industrial Arts

Subject Metals

Problem Orientation The Ramifications Of Change Grade 10-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

1. Discuss local or widely known pollution problem pertaining to metals industry, ie:
   1. Water pollution-- Lake Superior
   2. Noise pollution-- Foundry
   3. Air pollution - Foundry, steel mill
2. Either-
   1. Have open discussion as to what effects an attempt to clear up a pollution problem has on each aspect of society, ie, Society gets excited, fires up politicans, they chase industry, try to force change. Products prices go up to meet increase, etc.

   -or-

   2. Organize round table discussion between (con't)

II. Outside Resource and Community Activities

A. Local economist.
B. Industrial Commission representative.
C. Local politician.
D. Representative of local metal-fabricating industry.

Resource and Reference Materials	Continued and Additional Sug
Publications.	(Con't from I.) industrial representative, to bring out changes caused an industrial pollution pro
Audio-Visual #03140- Air Pollution University of Illinois film	
Community. Local economist. Industril Commission Rep. Local politician. Rep. from local metal working plant.	

s	Continued and Additional Suggested Learning Experiences
	(Con't from I.) industrial representative, economist, & politician to bring out changes caused by attempting to solve an industrial pollution problem.

CONCEPT 9. Man has the ability to manage, manipulate, and change his environment.

Discipline Area Indu

Subject Meta

Problem Orientation E A

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The student will report on two foundries that have installed pollution abatement equipment. Affective: The students will realize that foundries produce not only castings but also air, water & noise pollution. Skills to be Learned 1. Man can manage pollution if he wants to. 2. Various forms of pollution affect human behavior. 3. What pollutants are produced by foundries.	I. Student-Centered in class activity A. View movie Iron Product of the Blast Furnace. B. Class discussion: 1. What pollutants are produced by a foundry? A. Air B. Water C. Noise D. Thermal 2. Are the pollutants an environmental hazard? How? What is being done? What can be done? C. Relate the results of the discussion back to concept #9.

ge

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Foundry Pollution Abatement Grade 7-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity
   A. View movie Iron Product of the Blast Furnace.
   B. Class discussion:
      1. What pollutants are produced by a foundry?
         A. Air
         B. Water
         C. Noise
         D. Thermal
      2. Are the pollutants an environmental hazard? How? What is being done? What can be done?
   C. Relate the results of the discussion back to concept #9.

II. Outside Resource and Community Activites
   A. Environmental engineer from foundry.
   B. D.N.R.
   C. Local industry rep. in whose company pollution abatement equipment has been installed.

Resource and Reference Materials	Continued and Additional Sugges
Publications: Exploring Patternmaking and Foundry Miner & Miller D. VanNostrand Company	1. Develop a collection of lo articles which discuss loc related pollution problems chronological sequence can
Audio-Visual: #80067 Noise & Health University of Ill. #1100 Iron: Product of the Blast Furnace BAVI	
Community: 1. Environmental engineers 2. D.N.R. 3. Local industry rep.	

Materials	Continued and Additional Suggested Learning Experiences
and Foundry	1. Develop a collection of local newspaper articles which discuss local industry related pollution problems so that a chronological sequence can be followed.
the	
eers	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 10. Short-term economic gains may produce long-term environmental losses.

Discipline Area Indus

Subject Metals

Problem Orientation M

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will be able to list, the way man's early mining is now costing us money to reclaim the land. Affective: As an adult, the student will be a concerned citizen about land use, and mining operations. Skills to be Learned Land reclamation	I. Student-Centered in class activity 1. Students will view film on ore open pit mining. 2. Students will view slides of old abandoned open pit mines to view how the area is a total waste land. 3. Students will develop plans that could have been used to reclaim the area as it was mined. 4. Students will develop plans that could be used to relaim these areas today.

ort-term economic gains

duce long-term

mental losses.

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Mining Waste Grade 7-12

ORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
The student e to list, the arly mining ing us money the land. As an adult, will be a itizen about ıd mining	I. Student-Centered in class activity 1. Students will view film on ore open pit mining. 2. Students will view slides of old abandoned open pit mines to view how the area is a total waste land. 3. Students will develop plans that could have been used to reclaim the area as it was mined. 4. Students will develop plans that could be used to relaim these areas today.	II. Outside Resource and Community Activities Mining companies. Land developers.
e Learned ation		

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: Encyclopedias Forging and Welding, Robert E. Smith McKnight & McKnight Audio-Visual: #51311 Copper Mining University of Ill. #1198 Iron Ore Mining BAVI Community: Land developer	

terials	Continued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

Discipline Area Industrial

Subject Metals

Problem Orientation Allevi
Waste

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE
Cognitive: The student will list 5 places in which cumulative error will lead to waste. Affective: The student will become aware of a small error multiplying into a large waste. Skills to be Learned 1. Accuracy in measurement 2. Economics 3. Multiplication of error	I. Student-Centered in class activity A. Basically a general discussion using examples: 1. Three classes cutting stock from large piece; if each person cuts his 1/16" long, a full piece or more is wasted before work is started. 2. One person welding without system to exhaust fumes, result is negligible. Many persons welding without exhaust system could be fatal. B. Relate "one instance not too bad, but many instances can be dreadful" Theory to environmental problems, ie: 1. Exhaust emission 2. Water pollution 3. Environmental deterioration

II. Ou
Ac
A.

B.
C.

:s, duplicated

:luce significant

:ations over

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Alleviations of Waste Grade 7-12

IVES	SUGGESTED LEARNING EXPERIENCES	
g ement rror	I. Student-Centered in class activity A. Basically a general discussion using examples: 1. Three classes cutting stock from large piece; if each person cuts his 1/16" long, a full piece or more is wasted before work is started. 2. One person welding without system to exhaust fumes, result is negligible. Many persons welding without exhaust system could be fatal. B. Relate "one instance not too bad, but many instances can be dreadful" Theory to environmental problems, ie: 1. Exhaust emission 2. Water pollution 3. Environmental deterioration	II. Outside Resource and Activities A. Quality control personnel B. Purchasing agent C. Salvage engineer

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: Metalwork Technology and Practice Ludwig & McCarthy, McKnight & McKnight Technical Metals, Harold V. Johnson Chas. A. Bennett Co. Audio-Visual: Home-made slide series of photo series showing areas or examples of great waste. Community: 1. Quality control person 2. Purchasing agent 3. Salvage engineer	1. Have students develop easy reference list or bulletin board stating where sma wastes should be avoided. 2. Set up "point system" and see what membe class can find most instances of waste i 1. School 2. Local community

Continued and Additional Suggested Learning Experiences

1. Have students develop easy reference list or bulletin board stating where small wastes should be avoided.
2. Set up "point system" and see what member of class can find most instances of waste in
   1. School
   2. Local community

CONCEPT

12. Private ownership must be regarded as a stewardship and should not enroach upon or violate the individual right of others.

Discipline Area Indus

Subject Metals

Problem Orientation My yo

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will list 5 "wastes" & explain how these "wastes" affect others. Affective: The student will realize that all pollutants & waste violate the rights of others. Skills to be Learned 1. Individual acts affect others. 2. How pollutants are controlled.	I. Student-Centered in class activity A. Class discussion 1. Select a few metal-working industries & develop a list of wastes produced. 2. How do these "wastes" effect others? 3. Is the effect desir-able or undesirable? 4. What can be done? 5. What is being done? B. Study thru class developed method, the interaction of "rights".

ship must be

ardship and

upon or violate

nt of others.

Discipline Area Industrial Arts

Subject Metals

Problem Orientation My rights vs. your rights Grade 7-12

IVES	SUGGESTED LEARNING EXPERIENCES	
ect	I. Student-Centered in class activity A. Class discussion 1. Select a few metal-working industries & develop a list of wastes produced. 2. How do these "wastes" effect others? 3. Is the effect desir-able or undesirable? 4. What can be done? 5. What is being done? B. Study thru class developed method, the interaction of "rights".	II. Outside Resource and Community Activities A. Public relations dept. of local manufacturing plant. B. D.N.R.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Metalwork Technology and Practice. Ludwig & McCarthy McKnight & McKnight Modern Metalworking, John R. Walker Woodheart-Willcox Audio-Visual: Community: 1. Public relations man from local manufacturer 2. D.N.R.	1. Have students research how handle "encroachment of ri

ls	Continued and Additional Suggested Learning Experiences
tice.	1. Have students research how local manufacturers handle "encroachment of rights"

PROJECT I-C-E Episode Evaluation Form (Reproduce

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode
form. Feel free to adapt it and
your critiques and comments - ne
hand column, please rate (poor,
make specific comments or sugges
vided to help us make this a mor

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

ehavioral Objectives
. Cognitive:

. Affective:

kills Developed

uggested Learning Experiences
. In Class:

. Outside & Community Activities:

Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-0-9
1927 Main Street
Green Bay, WI 54301